The Social Capital Effect on Economic Growth

A Senior Honors Thesis

Presented in Partial Fulfillment of the Requirements
for graduation with distinction in Economics
in the College of Social and Behavioral Sciences
at The Ohio State University

By
José Mustre del Río

The Ohio State University
May 2005

Project Adviser: Eric O'N. Fisher, Associate Professor
Department of Economics

Acknowledgements

The author would like to thank Dr. Eric Fisher for his infinite patience and wisdom through out this project and the rest of the faculty at Department of Economics at The Ohio State University for comments and support. Furthermore, the author would like to thank Dr. Gene Mumy and Dr. Timothy Frye for their comments and help as thesis committee members. The author would also like to thank comments from conference participants at the 2005 Carroll Round Conference at Georgetown University. Finally, the author extends his humble appreciation and gratitude to his parents, Marcela and José, for their endless guidance and support throughout his entire education and furthermore, thanks to Jessica Ford for her unconditional support.

Table of Contents

1. Introduction

Recent economic and sociological research has suggested the importance of social capital as a determinant of economic performance. In a seminal contribution to the body of research, Putnam (1993) finds that local governments of Italian regions characterized by strong civic participation, perform better when delivering public goods. Corroborating Putnam's findings worldwide, La Porta et al. (1997) find that in a cross section of countries, trust and civic engagement are associated with improvements in the performance of firms and the government. Finally, Knack and Keefer (1997) find that in a cross section of countries, trust and civic engagement have a significant positive effect on economic growth even once controlling for other factors such as initial income and educational level. These last two studies rely on trust and civic engagement data from the World Value Surveys (WVS) of 1981 and 1990-1991 to quantify social capital.

In this investigation we propose a new measure of social capital and implicitly ask: are the World Value Surveys reliable and do they measure social capital effectively? These surveys could potentially be subject to cultural biases in responding and reporting simply because there is no uniform standard of trustworthiness or because it is cumbersome to translate notions of trustworthiness from one language to another. To speak of trustworthiness in Chinese may not be the same as speaking of trustworthiness in Italian and much less in Hausa. Furthermore, these surveys do not capture long-term trends in social capital given that the surveys occur in two waves within a ten-year interval. Thus, it is not clear whether the data of the World Value Surveys is the result of a net change in social capital or merely opportune snapshots of the social climate in

countries around the world. Furthermore, the validity of inferences made based on such limited data is questionable.

This study attempts to confirm the conclusions of the previously mentioned works by using voter turnout in parliamentary elections as a measure of social capital, as previously suggested by Putnam (2000). Our analysis differs from the previous two by considering data over a fifty-year period (1950-2000), in an attempt to capture the effect that social capital may have on long-run economic performance. In addition, our measure of social capital is based on an observable behavior —voting— rather than a reported belief—trust. By using Ordinary Least Squares (OLS) on our cross section of countries, we attempt to estimate the effect that increasing voter turnout in parliamentary elections has on economic growth, once other macroeconomic factors are controlled. Given the nature of this study, it is possible that our dependent variable and one (or several) of the independent variables are determined simultaneously leading to a bias in estimation if this is not controlled. Also it is possible that our dependent variable causes the independent variables leading to a reverse causation or endogeneity bias. To control for these biases in estimation, we will use instrumental variable (IV) and two-stage least squares (2SLS) techniques.

Our initial findings suggest that once other factors are controlled, voter turnout does not have a significant effect on economic growth. This could be the result of one of the following possibilities: (1) voter turnout is an inaccurate measure of social capital; (2) social capital does not have a significant effect on long-run growth once other macroeconomic variables are controlled; or (3) the mechanism through which voter

turnout (as a measure of social capital) influences long-run growth is not as direct as our initial specification dictates.

Given La Porta et al.'s (1997) findings on the positive relationship between performance of large organizations and social capital and, Knack and Keefer's (1997) findings of a strong relationship between social capital and confidence in the government, we examine the possibility that our measure of social capital improves government performance. Following La Porta et al.'s (1997) framework we conclude that our measure of social capital is very significant for government performance when using a variety of measures of the perceived efficacy of the government. Following the widespread literature on the fundamental importance of institutions for growth [e.g. Acemoglu et al. (2004) or Hall and Jones (1999)], we suggest that the economic pay-off of social capital is via increased government performance—concurring with (3) as mentioned above.

This thesis is divided as follows. In section 2 we present an overview of the literature central to this investigation. In section 3 we present our baseline specification and use it to estimate the effect of social capital on growth using OLS and IV/2SLS techniques. In section 4 we consider one specific channel through which social capital may indirectly induce growth—government performance. Finally, in section 5 we conclude.

2. Review of the Literature

In this section we review the three main publications that this thesis is premised on. Central to our discussion is Putnam's (2000) book Bowling Alone: The Collapse and Decline of American Community. Given that much of our empirical work will hinge on claims of this book, the first portion of this section will provide a brief overview of the arguments of this work that are central to the analysis in section 3. Similarly, the second portion of this section will provide an overview of Hayek's (1944) The Road to Serfdom. Finally, we will review one of the most recent counterparts to our empirical analysis: Knack and Keefer's (1997) article "Does Social Capital Have an Economic Pay-off?"

2.1 Bowling Alone: The Collapse and Decline of American Community

Based on social capital theory, Robert D. Putnam attempts to explain the decline of civic and social life in American communities. He begins by explaining that the central tenet of social capital theory is that social networks have value since social contacts can affect the productivity of individuals and groups. "Social capital refers to connections among individuals —social networks and the norms of reciprocity and trustworthiness that arise from them (pg. 19)." Putnam goes on to explain that social capital has both an individual and collective aspect. For individuals, social capital helps to find jobs and companionship, while collectively social capital can have externalities that affect a whole community rather than just the person making the contact. In addition, Putnam emphasizes that social connections are also important because they foster norms of reciprocity. Particularly important to our future discussion is what Putnam calls generalized reciprocity: "I'll do this for you without expecting anything specific back from you, in the confident expectation that someone else will do something

for me down the road (pg. 21)." Putnam argues that "a society characterized by generalized reciprocity is more efficient than a distrustful society, for the same reason that money is more efficient than barter. If we don't have to exchange instantly, we can get a lot more accomplished (pg. 21)"—this difference between social capital rich and poor societies is what we test. In addition, Putnam argues that when economic and political dealing is contained in dense social interaction, incentives to rent-seek are reduced.

In support of his hypothesis of America's declining social capital, in chapter 2 Putnam shows the important decrease in political participation by Americans. To motivate the importance of the decline in voter turnout, Putnam explains that "voting is the most common form of political activity and it embodies the most fundamental democratic principle of equality. Not to vote is to withdraw from the political community (pg. 35)." Furthermore, he argues that voting is an instructive proxy measure of broader social change: voters are more likely to be interested in politics, give to charity, volunteer, participate in public demonstrations and to cooperate with fellow citizens on community affairs. Putnam claims that recent work [i.e. Knack (1992), Conway (1991) and McCann (1998)] suggests that voting itself encourages volunteering and other forms of good citizenship.

In chapter 8, Putnam discusses reciprocity and trust. Putnam argues that trusting communities have a measurable economic advantage since they reduce transactions costs. Furthermore, Putnam argues that while a legal system can give us assurance of the good faith of others another solution to this problem is generalized reciprocity, which can exist in dense networks of social exchange. Similar to voter turnout, social trust seems to

have peeked in the US in the mid 1960s and declined thereafter. As a measure of trustworthiness and honesty, Putnam offers crime rates. He argues that crime maybe a symptom of weakened social control and shows that crime rates began to rise sharply in the middle of the 1960s at the same time as other measures of social capital and trust began to decline. Again Putnam argues that an alternative to generalized reciprocity is the rule of law and supports his claim by showing that starting in the 1970s the number of lawyers in the US steadily increased. While it can be argued that this is the result of increasing crime rates, there was no major growth in criminal law during this period. Putnam states that the largest increase in demand for legal work was in the form of "preventive lawyering" or the need to "get it in writing." Putnam argues that this reflects America's heavy reliance on formal institutions rather than using informal networks supported by generalized reciprocity.

Next and essential to our discussion, Putnam presents his "Social Capital Index" in chapter 16. Using various independent measures, Putnam attempts to rate social capital in the 50 states. Putnam's index includes measures of community organizational life, engagement in public affairs, community volunteerism, informal sociability and social trust. He goes on to argue that the fourteen indicators measure related but distinct facets of social capital. Of particular importance to us is one of Putnam's engagement in public affairs measure, voter turnout in presidential elections 1988 and 1992. While no single measure can define a state's social capital, Putnam argues that interstate differences seem to go together given the correlations of the individual measures with the overall index (e.g. places with high electoral turnout tend to have high social trust). For example,

Putnam's measure of social trust has a correlation of 0.92 with the overall index while turnout in presidential elections has a correlation of 0.84 with the overall index.

Also key to our analysis is Putnam's discussion of economic prosperity and its relation to social capital in chapter 19. At the microeconomic level, Putnam argues that social capital helps us surmount employment barriers and allows us to achieve social status and economic rewards. As an example, Putnam compares the success of California's Silicon Valley and demise of Boston's route 128. While route 128 maintained traditional norms of corporate hierarchy, secrecy and self-sufficiency, Silicon Valley entrepreneurs shared information, problem-solving techniques and created social clubs. Putnam suggests that Silicon Valley's industrial system based on regional networking allowed for flexibility and dynamic technological adoption as opposed to route 128 rigid experimentation and learning confined within individual firms. According to Putnam, industrial districts like Silicon Valley allow for information flows and economies of scale. Putnam concludes the chapter by encouraging the view that social capital may boost economic efficiency —benefiting all— albeit the unclear aggregate evidence.

Chapter 20 focuses on the importance of social connectedness on health and well-being. Putnam argues that social cohesion is beneficial for health since social networks can provide tangible assistance that reduces physical and psychic stress. He also argues that social networks may reinforce healthy norms—since isolated people are more likely to smoke and drink— and that social capital may stimulate the immune system to fight disease and stress. Putnam also cites work done at Harvard's School of Public Health, which finds a strong link between physical health and social capital across the US. States with fair or poor health were the same where residents distrusted others; states with low

scores on the "Social Capital Index" also had poor health and high all-cause mortality rates. Putnam concludes that social networks allow us to stay healthy.

Finally, in chapter 21 Putnam mentions the role social capital plays in improving democracy. Externally, social capital, in the form of voluntary organizations, allows individuals to express their interests and demands on the government and provides protection from abuses of political leaders. Internally, associations and networks of civic engagement instill in their members habits of cooperation and public-spiritedness while providing practical skills necessary for public life. In this sense, voluntary organizations are "schools for democracy." Furthermore, Putnam suggests that social capital may improve the functioning and accountability of the representative government. When comparing the Northern and Southern regions of Italy, Putnam finds that in the Northern regions—where social networks were organized horizontally and where solidarity, civic participation and integrity are valued—democracy works. In the Southern regions characterized by weak social engagement and cultural associations, the representative government is less effective. Putnam also suggests that social capital matters for the functioning of the government in the US. In social capital rich states, politics is more issue oriented and apparently less corrupt.

2.2 The Road to Serfdom

In this work, Friedrich Von Hayek issues a warning regarding the political direction that democracies such as the US and England are leaning towards after World War II. Throughout this book Hayek expresses his concern that collectivism and social planning can ultimately lead to the destruction of political and economic freedom. While

supporting individualism over collectivism, Hayek also provides arguments for the strong correlation between democracy and economic growth.

Hayek explains that the gradual transformation from a rigidly organized hierarchic system into one where men could attempt to shape their own life was closely associated with the growth of commerce (1944, pg. 14). Hayek also argues that this commercial growth "took firm root wherever there was no despotic political power to stifle it. In the Low Countries and Britain it for a long time enjoyed its fullest development and for the first time had an opportunity to grow freely and to become the foundation of the social and political life of these countries (pg. 14-15)." Furthermore, Hayek argues that during the modern period of European history "the general direction of social development was one of freeing the individual from ties which had bound his activities; the conscious realization that the spontaneous and uncontrolled efforts of individuals were capable of producing a complex order of economic activities could only come after this development had made some progress (pg. 15)." "The subsequent elaboration of a consistent argument in favor of economic freedom was the outcome of a free growth of economic activity which had been the undesigned and unforeseen by-product of political freedom (pg. 15)." In addition, when talking about liberalism Hayek argues that "the immediate improvement of liberalism had to rely largely on the gradual increase of wealth which freedom brought about (pg. 19)." Stressing the importance of democracy for freedom, Hayek quotes De Tocqueville's claim that "democracy extends the sphere of individual freedom; socialism restricts it (pg. 25)." Thus, from Hayek's work we can argue reverse causation and simultaneous determination of economic

growth and democracy since the development of one produces (and requires) the development of the other.

2.3 Does Social Capital Have An Economic Pay-off?

In this article, Stephen Knack and Philip Keefer address empirically the question of the impact social capital has on economic growth. Knack and Keefer use data from the World Values Surveys (WVS) 1981 and 1990-1991 in creating their TRUST variable representing social capital. TRUST is percentage of respondents in each nation replying "most people can be trusted" when asked "generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?" Knack and Keefer find a strong and significant relationship between social capital and growth when using this measure of social capital and controlling for human capital (primary and secondary school enrollment), initial income (real GDP per capita in 1980) and the price level of investment goods (relative to the US). Even when using ethnolinguistic fractionalization and the number of law students in 1963 as a percentage of all postsecondary students as instruments for social capital, TRUST remains a predictor of growth.

Next Knack and Keefer consider channels through which trust may affect economic outcomes. In particular, they consider the impact trust may have on property and contractual rights and, the impact trust may have on government performance. When controlling for human capital levels and initial income, Knack and Keefer find that their TRUST variable is the only significant predictor of government performance (an index based on data from the WVS). Similarly, when considering risk faced by foreign investors Knack and Keefer find that TRUST significantly predicts this risk. Finally,

Knack and Keefer find significant relationships between TRUST and property rights security and, TRUST and "executive constraints." Knack and Keefer then suggest that trust may improve governmental efficiency and increase investors' confidence in contract enforcement. However, they are unable to explain the direct path through which trust affects economic performance since their property rights measures and confidence in the government are borderline significant in growth regressions or investment regressions. Therefore, while Knack and Keefer's intermediate findings are very promising, overall they are unable to provide conclusive evidence for the mechanism through which social capital can improve economic performance.

3. Initial Results

This chapter will present a series of specifications that attempt to measure the social capital effect on economic growth. First, we will mention our expectations and present our basic model. We continue by giving reasons for the construction of our model and proceed with its estimation. After presenting our initial results, we show the robustness of them with IV and 2SLS techniques. Finally, we will conclude the chapter by attempting to coalesce our expectations and empirical findings.

3.1 Expectations A Priori

In this subsection we will present our expectations prior to any regression analysis. First, we will support voter turnout as a measure of social capital with previous findings in the literature. Then we will present some graphical evidence that suggests the feasibility of our expectations. Finally, we will highlight our main expectations.

According to Knack and Keefer (1997, pg. 4) "knowledge of politics and public affairs by large numbers of citizens, and their participation, are important potential checks on the ability of politicians and bureaucrats to enrich themselves or narrow interests that they are allied with." Putnam (2000, pg. 35) argues that "voting is the most common form of political activity, and it embodies the most fundamental democratic principle of equality. Not to vote is to withdraw from the political community." As a measure of social capital Putnam (2000, pg. 35) stresses that: "voting is an instructive proxy measure of broader social change. Voters are more likely to be interested in politics, give to charity, volunteer, serve on juries, attend community school board meetings..." However, Putnam (2000) later admits that voting and following politics are relatively undemanding forms of participation and strictly speaking are not forms of

social capital since they can be done alone (pg. 37). For this reason it is possible that voting may in fact overstate the stock of social capital in a nation.

Given Knack and Keefer's (1997) results on the strong association between trust, civic norms and stronger economic performance, our initial suspicion is that we may be able to find a positive relationship between our measure of social capital —voter turnout— and economic performance. In constructing the "Social Capital Index" for his US study, Putnam (2000) finds a strong correlation between his index and voter turnout (0.84). The analogue of Knack and Keefer's (1997) TRUST variable in Putnam's (2000) index has a correlation of 0.92 with the overall index (the strongest for any single component). When comparing our measure of social capital to the trust data from the World Values Survey used in constructing the TRUST variable in Knack and Keefer (1997), we find a modest correlation of 0.45. Graphically this relationship is depicted in figure 1.

Thus, given Putnam's (2000) and Knack and Keefer's (1997) findings there is: (1) evidence that voter turnout may be useful as a measure of social capital; and (2) evidence that social capital in fact has an effect on growth. However, since voting can be done alone (as mentioned above) we must emphasize that our measure of social capital can overstate the actual level of social capital and hence inflate our results. Therefore, if we find statistically significant results in favor of a social capital effect on growth, these should be understood as upper bounds of the true effect. As a prologue to our series of statistical tests, we plot the relationship between the logarithm of GDP per capita in 2000 and voter turnout in figure 2, finding a reasonably linear relationship between the two.

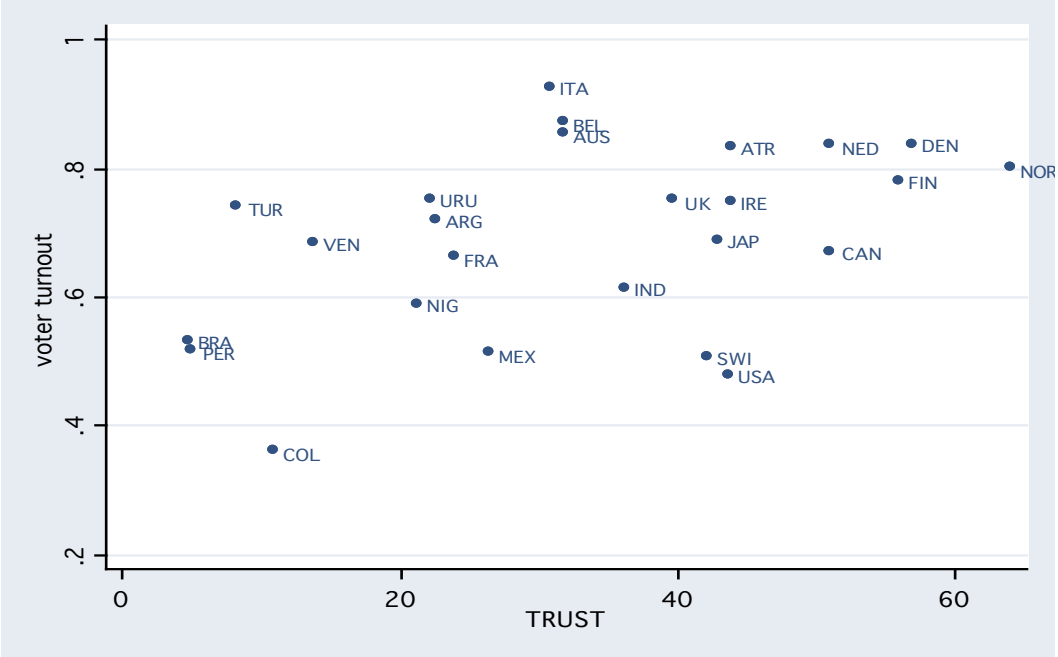

Figure 1.

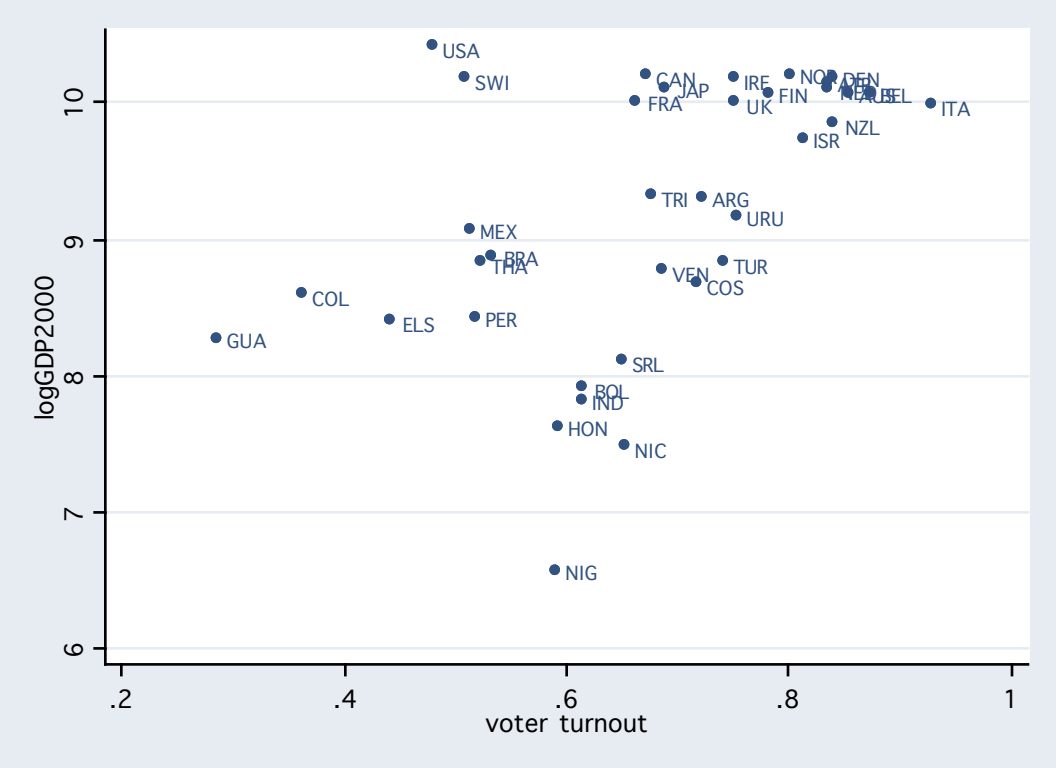

Figure 2.

3.2 The Model and Basic Results

In this subsection we will present our formal model and basic results. First we will present the model and give reasons for its construction. Next, we report our initial results. Finally, we discuss shortcomings of our model.

Similar to Knack and Keefer's (1997) baseline specification, our proposed model is the following:

$$(1)\ \log GDP_i^{2000} = \beta_0 + \beta_1 vote_i + \beta_2 \log k_i^{2000} + \beta_3 \log GDP_i^{1950} + \beta_4 enroll_i + \varepsilon_i$$

where: $\log GDP_i^{2000}$ is the logarithm of real GDP per capita in the year 2000 (acting as our measure of income); β_0 is the intercept term (constant over all countries); $vote_i$ is our voter turnout measure; $\log k_i^{2000}$ is the natural logarithm of the approximate capital stock per capita in 2000; $\log GDP_i^{1950}$ is the logarithm of the initial real GDP per capita; $enroll_i$ is the gross secondary enrollment ratio averaged over 1960-2000 and ε_i is the classical error term.

Following Knack and Keefer's (1997) and La Porta et al.'s (1997) specifications, we assume that the intercept term is constant over all countries, implying an equal income level for all countries when none of the explanatory variables are present and no country specific or time specific exogenous shocks to income exist. Rather than controlling for the price level of investment (relative to the US) as in Knack and Keefer (1997), we control for the capital stock of each country, since differences in capital stocks can help explain differences in income and since we are trying to follow the growth specifications proposed by Mankiw et al. (1992). As our measure of social capital, we use voting in parliamentary elections to represent voter turnout instead of voting in presidential elections. Choosing the latter would restrict the list of countries included in

our analysis given that not all countries have an executive power embodied in a president, yet many do have a legislative power. Specifically, our measure of voter turnout is the number of votes divided by the voting age population figure [since this is the type of voter turnout figure used in constructing Putnam's (2000) "Social Capital Index"]. We include the gross secondary enrollment ratio as a measure of human capital, given that a more human capital can induce stronger growth (Barro, 1991). Finally, the initial level of real GDP per capita, $\log GDP^{1950}$ is included in our specification to control for convergence. Our baseline specification essentially implies that the ideal country from our dataset produces output based on endowments of physical capital, human capital and social capital. The error term in this model represents immeasurable factors such as technological advances. The results of running OLS on this baseline specification appear in Table 1.

Table 1 Dependent Variable logarithm of GDP per capita 2000

Method	OLS
Independent Variables	
$vote_i$	-0.23 (-0.77)
$\log k_i^{2000}$	0.68** (11.54)
$enroll_i$	0.32 (1.19)
$\log GDP_i^{1950}$	0.15♦ (1.90)
β_0	1.54** (2.81)
	N=36 R^2=0.96

Notes: t-ratios in parentheses. ♦significant at 10% level *significant at 5% level **significant at 1% level.

Our initial regression implies a negative and insignificant relationship between voter turnout and growth. The relatively high p-value for *vote* (0.45) reflects its inadequacy as an explanatory variable of growth. At this point, it is important to mention the effect of compulsory voting laws on voter turnout. While many countries do have compulsory voting laws with penalties ranging from minor fines to possible imprisonment, rarely are these laws enforced. When including dummy variables for compulsory voting laws and variables that measure the level of enforcement of these laws in unreported regressions, we systematically fail to reject that the coefficients on these variables are not statistically significant from 0. Thus, in order to avoid irrelevant variable biases in our regressions, we do not include them.

As expected, a larger capital stock reflects higher income per capita. In particular, our estimated coefficient (interpreted as an elasticity) implies that a 1% increase the capital stock of the year 2000 will increase income per capita by roughly .68%. In addition, the significant and positive coefficient on the initial level of GDP per capita implies that countries will not converge conditionally. An 11% increase in GDP per capita of 1950 results in an increase in income in the year 2000 by .15%. While this at first may be surprising, the heterogeneity in final income levels of our data set suggests historical divergence of incomes between the richest and poorest countries in our sample. Our initial results would support Pritchett's (1997) findings of considerable divergence in incomes between the richest countries in the world and the rest. Furthermore, our estimated coefficient may reflect that divergence in economic performance can only captured in the long-run (such as our examined 50 year period) while 20-year studies may capture some convergence. Also since our dependent variable is final income, the

coefficient on initial income implies no beta convergence, which does not contradict previous findings of sigma convergence.

Surprisingly, we find that our human capital measure is insignificant—i.e., increases in secondary enrollment are not associated with increases in income. While this is inconsistent with our prior expectations and other results in the literature, we can offer an explanation for the insignificance human capital in our regressions. It is very likely that better educated countries will tend to vote more and participate in other civic activities more (relative to less educated countries) since civic responsibility can be instilled through schooling. Furthermore, Barro (1991) finds that initial human capital has a positive effect on physical investment leading us to believe that human capital may have a similar effect on our capital stock measure. Thus, it is possible that part of education's explanatory power on final income is being shared by our social capital and physical capital measures. In our sample of countries, human capital is correlated with social capital and physical capital with correlation coefficients of 0.57 and 0.79 respectively.

A process that we are overlooking and which may be affecting our voter turnout coefficient is the simultaneity between growth in incomes and voter turnout, due to the latter acting as a measure of political and personal liberty. From Hayek's (1944) discussion on the evolution of personal liberty and economic prosperity we can suggest that economic growth and political freedom are determined simultaneously. Putnam (2000) argues that "voting embodies the most fundamental democratic principle of equality," while Hayek (1960) points out that equality in front of the law and in making the law is the where the ideas of democracy and liberalism meet. Thus, we can argue that

higher voter turnout reflects a stronger democracy where individual liberty is upheld. Hence, there may be some reverse causality between rising incomes and voter turnout as the latter may represent the level of democracy in a nation.

3.3 IV and 2SLS Regressions

To circumvent the reverse causality and simultaneity biases, in the next specifications we attempt two stage least squares (2SLS) and instrumental variables (IV) techniques to estimate the effect that voter turnout may have on final income. With this approach, we should be able to isolate the true exogenous effect that voter turnout has on income. This in turn could change our initial results and provide empirical evidence in favor of Putnam's claim that voting is an instructive proxy for social capital. First, we will have a technical digression on how IV and 2SLS work. Then, we will use a series of instruments and present results when using each instrument.

3.3.1 Technical Digression: IV and 2SLS

Instrumental variables (IV) and two-stage least squares are regression techniques used whenever one or several of the independent variables in a regression are endogenous—i.e. not predetermined and thus not orthogonal to the error term. Given the assumptions of the classical linear model, a regressor not being orthogonal to the error term is equivalent to the regressor having as non-zero correlation with the error term: $Cov(\varepsilon_i, x_{ij}) = E[x_{ij}\varepsilon_i] - E[x_{ij}]E[\varepsilon_i] = E[x_{ij}\varepsilon_i] \neq 0$, since $E[\varepsilon_i] = 0$. This poses a problem when using OLS to estimate a linear equation because coefficient estimates will be biased since the strict exogeneity assumption of OLS will be violated. Non-zero correlation with the error term can arise in the following situations: when x_{ij} is measured with error, x_{ij} is

simultaneously determined with the dependent variable or similarly, the dependent variable causes x_{ij}.

The instrumental variables (IV) technique circumvents these problems by using a predetermined (exogenous) variable that is correlated with x_{ij} (endogenous regressor) to estimate a consistent estimate of the coefficient on x_{ij}. As an example, if we are estimating $y_i = \alpha_0 + \alpha_1 x_i + \varepsilon_i$, where x_i is correlated with the error term, the IV estimator of α_1 would be:

$$\hat{\alpha}_{1,IV} = \frac{Cov(z_i, y_i)}{Cov(z_i, x_i)}$$

where z_i is an exogenous variable called the "instrument" of x_i. Intuitively, the IV estimator is a measure of the correlation between the endogenous regressor x_i and dependent variable y_i deflated or weighed by the portion of x_i which is not determined by y_i. As mentioned above this determination can be through measurement error, simultaneity or reverse causation.

Another procedure that can be used to avoid endogeneity biases is two-stage least squares (2SLS). This procedure is called 2SLS since it entails running two regressions: in the first stage the endogenous variable is regressed on an instrument(s) and a constant to obtain fitted values of the endogenous variable. In the second stage, these fitted values are used to estimate the original equation. In our previous example, the first stage would consist of estimating $x_i = \gamma_0 + \gamma_1 z_i + v_i$ with OLS and then calculating the fitted values, $\hat{x}_i$. In the second stage, we would use the fitted values to estimate $y_i = \alpha_0 + \alpha_1 \hat{x}_i + \varepsilon_i$ to obtain a consistent estimate of α_1. When using 2SLS we assume that the error terms in the first

and second stages are uncorrelated. In general, the 2SLS estimator can be written as an IV estimator when using the appropriate instruments (Hayashi, 2000).

3.3.2 Religion and Legal Origin as Instruments

In this subsection, we will use religion and legal origin as instruments for social capital. First, we will discuss why is religion is a viable instrument and proceed with the estimation of our model using 2SLS. Second we will emphasize the usefulness of legal origin as an instrument for social capital and also estimate our model using 2SLS.

Putnam (1993) argues that hierarchical religions discourage "horizontal" ties between people and therefore the formation of trust or social capital. La Porta et al. (1997) find a negative correlation (-0.47) between the percentage of Catholics in a country and trust. For our sample of countries and measure of social capital the correlation has the same direction but not as strong (-0.31). This relationship is plotted in figure 3. The correlation between the incidence of Muslim people and voting is minimal (.0184), however this figure is misleading since our group of countries is predominantly Catholic with very low percentages of Muslims. Given that the percentage of Catholic and Muslim people in a country reflects cultural attitudes and preferences rather than economic conditions and preferences, we believe that these figures can serve as good instruments primarily because they should not be determined by contemporaneous economic conditions. Furthermore, La Porta et al. (1997) have also used religion as an instrument for social capital. Using 2SLS we estimate the following set of equations:

(1) $\log GDP_i^{2000} = \beta_0 + \beta_1 vote_i + \beta_2 \log k_i^{2000} + \beta_3 \log GDP_i^{1950} + \beta_4 enroll_i + \varepsilon_i$

(2) $vote_i = \gamma_0 + \gamma_1 catholic_i^{1980} + \gamma_2 mus\lim_i^{1980} + \upsilon_i$

The results from using the percentage of Catholics and Muslims in 1980 as instruments for social capital appear in the first column of Table 2.

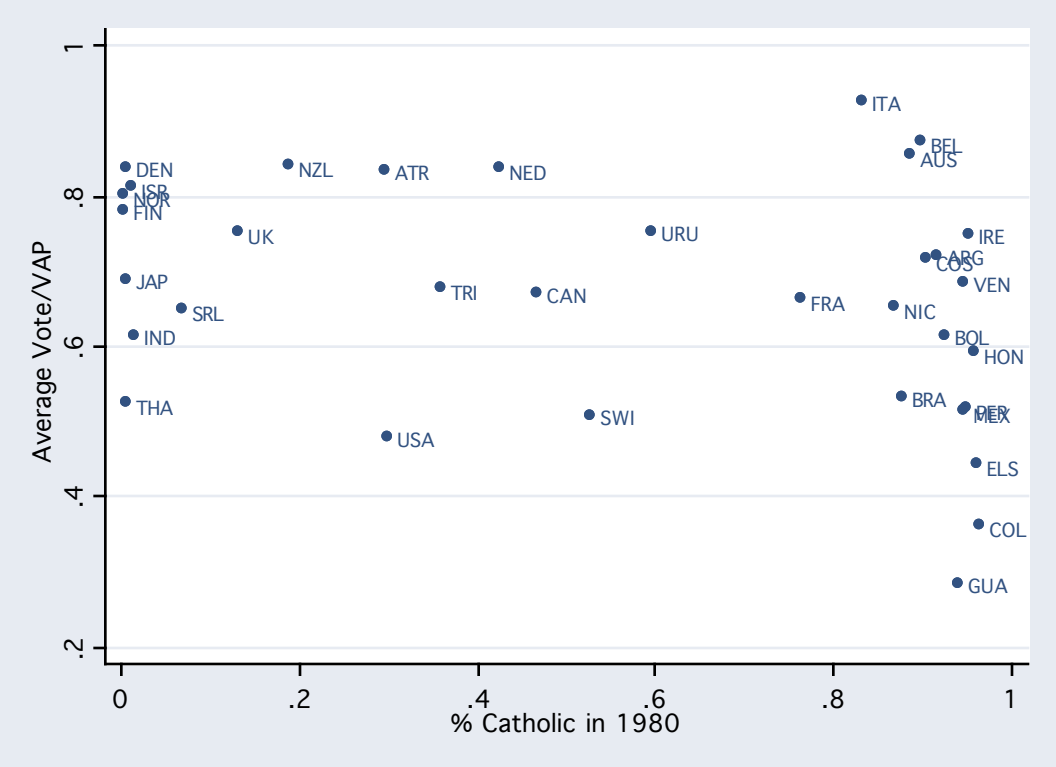

Figure 3.

Our first 2SLS rejects the claim that voter turnout (as a measure of social capital) has any effect on income. Furthermore, we maintain the conclusions that a higher capital stock has a positive effect on income and countries do not beta converge. Again, secondary school enrollment is insignificant. Looking at the results for the first stage (table 1), we find that a large Catholic presence in a country is associated with decreases in voter turnout rates. In particular, a 1% increase in the Catholic population is associated with a 0.17% decrease in voter turnout. The coefficient on the Muslim variable is not statistically different from zero but we reiterate that our set of nations offers very low proportions of Muslims in their population (India being the largest with 11.6%), hindering us from making any meaningful statements about this coefficient. However,

given the results for our Catholic variable, we do find empirical evidence in favor of Putnam's claim that hierarchical religions are detrimental to social capital yet, we find no evidence for any social capital effect on income.

Table 2 Dependent Variable logarithm of GDP per capita 2000

	1	2
Method	2SLS	2SLS
Independent Variables		
$vote_i$	1.83 (0.61)	0.76 (0.40)
$\log k_i^{2000}$	0.58** (4.28)	0.65** (7.21)
$enroll_i$	-0.11 (-0.12)	0.07 (0.12)
$\log GDP_i^{1950}$	0.14 (1.07)	0.16♦ (1.71)
β_0	1.41 (1.17)	1.17 (1.26)
	N=34 R^2=0.88	N=36 R^2=0.94

First Stage Voter Turnout

	equation (2)		equation (3)
$catholic_i^{1980}$	-0.17** (-2.34)	$french_i$	-0.17♦ (-1.85)
mus_i^{1980}	-1.06 (-1.01)	$british_i$	-0.13 (-1.27)
γ_0	0.78** (14.02)	$german_i$	-0.12 (-1.00)
		γ_0	0.81** (9.34)
	N=34 R^2=0.15		N=36 R^2=0.10

Notes: t-ratios in parentheses. ♦significant at 10% level *significant at 5% level **significant at 1% level.

For our second 2SLS regression we use legal origin as an instrument for voter turnout. Previously in the growth literature, Levine and Zervos (1998) have used legal

origin as an instrument for financial development to show its link to economic growth. Here we propose legal origin as an instrument for voter turnout in expectation that countries whose legal origin is more authoritarian will display lower voter turnout rates, while countries whose legal origin is more democratic should have higher voter turnout rates. While at some point in the history of the countries we examine legal origin was endogenous (the decision made by colonizers to occupy and instate new institutions in a foreign land may have been determined by the natural resources of this land), present economic conditions of the period we examine should have no effect on legal origin. Thus for our model, legal origin appears to be a viable instrument for social capital.

Given that a large proportion of the countries we study are ex-British or French colonies (and under the assumption that these colonies usually inherit the dominant religion of the colonizing country), we should expect our results to be similar to those of the previous regression. For example, in our data set we find a strong correlation between French legal origin and Catholicism in 1980 (0.79). Therefore, in this 2SLS we should find a significant effect of French legal origin on voter turnout but no significant effect of voter turnout on income. For this 2SLS regression we estimate the following set of equations:

(1) $\log GDP_i^{2000} = \beta_0 + \beta_1 vote_i + \beta_2 \log k_i^{2000} + \beta_3 \log GDP_i^{1950} + \beta_4 enroll_i + \varepsilon_i$

(3) $vote_i = \gamma_0 + \gamma_1 french_i + \gamma_2 british_i + \gamma_3 german_i + \upsilon_i$

where *french*, *british* and *german* are dummies for legal origin and υ is a classical error term. The results of running this 2SLS regression appear in column 2 of Table 2.

As expected, the first stage shows that French legal origin is statistically significant at the 10% level (p-value 0.069), while British and German legal origin have

no significant effects. The coefficient on the dummy variable for French legal origin implies a considerable penalty on voter turnout if the dummy is active—a decrease in voter turnout of 17 percentage points relative to countries whose legal origin is Scandinavian (the omitted group). However, in the second stage we again conclude that voter turnout has no statistically significant effect on income while capital stock and initial GDP per capita do. The fact that French legal origin reduces voter turnout should come as no surprise since the French legal system was a by-product of the Napoleonic regime. Compared to the Common Law, the Napoleonic code focused on state building and not on protecting individuals against arbitrary power of the government (Hayek, 1960). Therefore, countries with this type of legal structure should have lower turnout rates given that any sense of democracy in these countries is probably artificial.

La Porta et al. (1998) find that countries of French legal origin offer the worse legal protection to investors compared to British and German legal origin countries and —as adaptations to weak legal protection— have highly concentrated ownership in companies and mandatory dividends. If Putnam were correct in concluding that legal structures are substitutes for strong social networks, then we would expect more social capital in French legal origin countries as a counter-mechanism for weak legal structures. Our measure of social capital seems to suggest otherwise.

3.3.3 Health and Age Distribution as Instruments

For our next set of regressions, we use health and the age distribution of a country as instruments for social capital. First, we will give reasons for using measures such as life expectancy, infant mortality and the crude death rate as instruments for social capital. Then, we will present the results of using these instruments. Next, we will offer support

for using the age distribution of a country as an instrument for social capital. Finally, we will present the results of using age as an instrument of social capital.

From section II we see that Putnam (2000) offers several theories that explain why social cohesion matters for health. We can argue that life expectancy (as well as other mortality and morbidity measures which will be presented below) is a reasonable instrument for social capital because of Putnam's arguments and the following argument. While life expectancy is related to economic conditions, life expectancy during our examine 50 year period was probably determined by prior economic conditions rather than current economic conditions due to the lag effect between technological advances, advances in medicine and their manifestations on living standards. A plot of life expectancy at birth for 1970 (provided from the Global Development Finance and World Development Indicators) versus voter turnout is presented in figure 4. Similarly, a plot of average life expectancy at birth (for the years 1950-2000) using data from the IDB is presented in figure 5. By comparing figures 4 and 5 we can see that the positive linear relationship between voter turnout and life expectancy is similar when using either initial levels or averages. Results from using each of these measures of life expectancy as instruments for social capital are presented (respectively) in the first and second columns of Table 3.

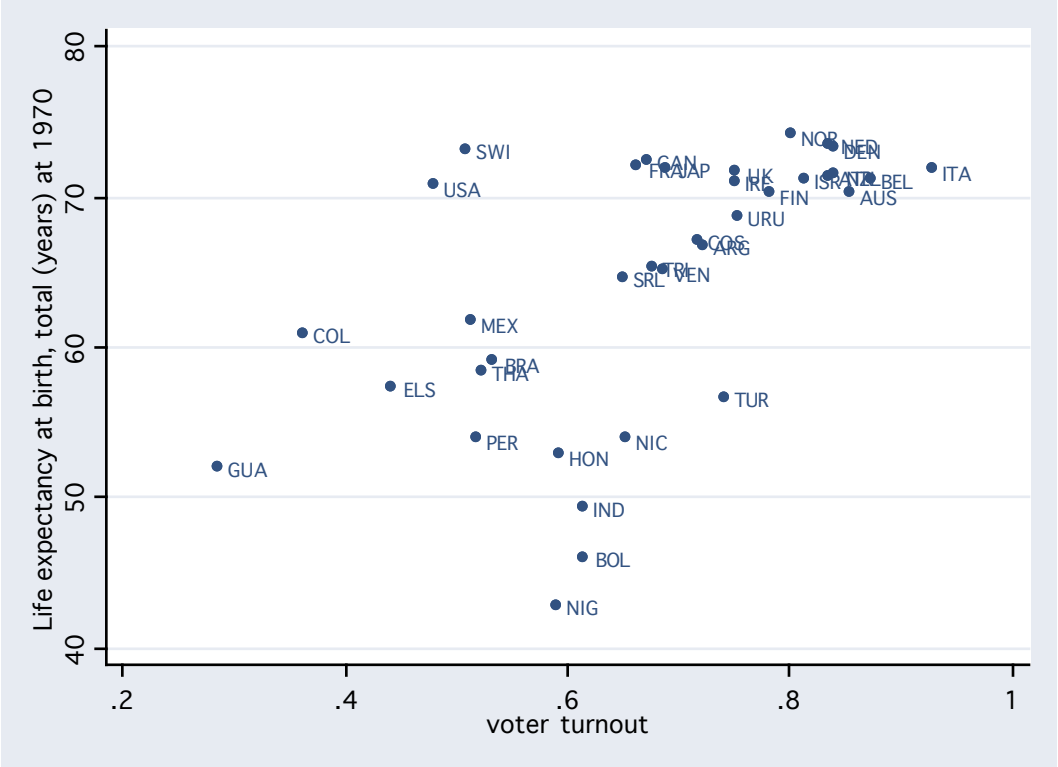

Figure 4.

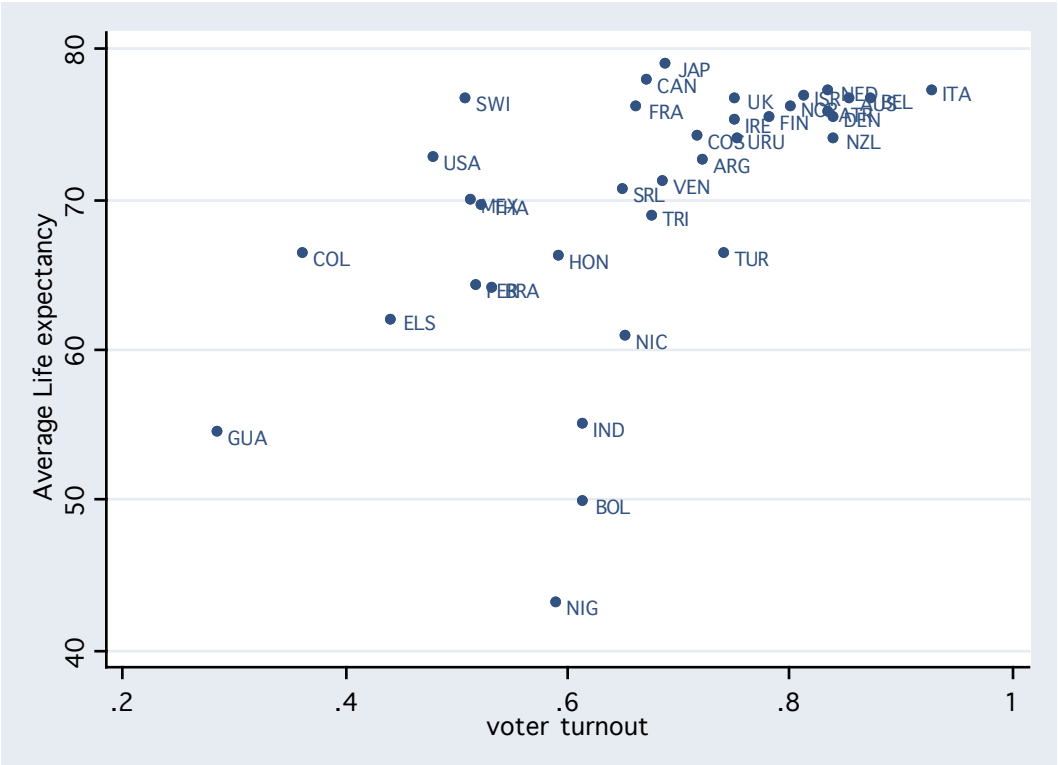

Figure 5.

Fortunately, the results of using either life expectancy at 1970 or average life expectancy are similar, supporting the robustness of our previous claims. While the fit when using the 1970 level is not as strong as when using averages (R^2 of 0.85 compared to 0.94) in both cases voter turnout is insignificant and now with the sign we would expect under Putnam's hypothesis—positive. Similarly, capital stock in 2000 and initial GDP per capita remain very strong predictors of future income. Once again secondary enrollment is insignificant in our regressions. Thus, under Putnam's hypothesis that societies with stronger social networks are healthier, it seems again that voter turnout is a poor measure of social capital.

Under the rationale of using life expectancy as an instrument for social capital, we now instrument social capital with the average crude death rate and average infant mortality. Putnam (2000) finds a strong negative relationship between the age-adjusted mortality rate in 1990 and his "Social Capital Index" concluding that mortality is lower in high social-capital states in the US. We find a weak negative correlation between the average crude death rate and voter turnout (-0.11), but a relatively strong negative relationship between average infant mortality and voter turnout (-0.54). The results of using the average crude death rate and average infant mortality as instruments for social capital appear respectively, in the third and fourth columns of Table 3.

When using the crude death rate as an instrument for social capital, our results are questionable. Despite the fact of having a very large F-statistic and R^2, only the coefficient on capital stock is significant. Voter turnout is insignificant and with the wrong sign. We believe that the underperformance of this fourth IV regression as compared to the prior four reflects the fact that the death rate is a weak instrument (i.e.

having low correlation with the endogenous regressor). However, when using the average infant mortality rate (a much stronger instrument), our results are very similar to the other IV specifications. Now, voter turnout has the correct sign yet is insignificant while the capital stock in 2000 and the initial GDP per capita level are both significant at the 1% and 10% level respectively. Secondary school enrollment remains insignificant. We conclude again (under the assumption of some relationship between health and social capital) that social capital does not have an effect on income.

Table 3 Dependent Variable logarithm of GDP per capita 2000

	1	2	3	4	5
Method	IV	IV	IV	IV	IV
Independent Variables					
$vote_i$	2.38 (1.07)	0.70 (0.56)	-5.19 (-0.52)	1.04 (0.72)	7.55 (0.36)
$\log k_i^{2000}$	0.60** (4.65)	0.65** (8.43)	0.84** (2.30)	0.64** (7.43)	0.43 (0.60)
$enroll_i$	-0.34 (-.46)	0.09 (0.20)	1.56 (0.59)	-0.01 (-0.00)	-1.63 (-0.30)
$\log GDP_i^{1950}$	0.18 (1.20)	0.16♦ (1.75)	0.10 (0.37)	0.17♦ (1.63)	0.23 (0.53)
β_0	0.58 (0.45)	1.20 (1.56)	3.36 (0.83)	1.07 (1.25)	-1.33 (-0.16)
	N=36 R^2=0.85	N=36 R^2=0.94	N=36 R^2=0.58	N=36 R^2= 0.93	N=36 R^2=0.03

Notes: t-ratios in parentheses. ♦significant at 10% level *significant at 5% level **significant at 1% level.

Next we will aid ourselves with another made by Putnam to construct an additional instrument for social capital. Putnam (2000) argues that virtually all of the long-run decline in voter turnout in the US can be attributed to the gradual replacement of voters who came of age before or during the New Deal and World War II by the generations who came later (pg. 33). He goes on to argue that "most of social change

involves both individual and generational processes" and change is easier for young people (pg. 34). When talking about the gradual widespread use of telephones for long-distance calls, Putnam argues that generational change became the dominant feature of this social change (pg. 34). On the basis that change is easier for young people, we would expect then that countries with younger populations are more encouraging of social change. Younger countries may be more willing to change deeply embedded social norms either to increase or decrease social capital. It seems reasonable then to hypothesize a strong correlation between young populations and social capital. When taking the percentage of the population between the ages of 15 and 64 (inclusive) and averaging each of these percentages over the years 1950-2000 we in fact do find a reasonably strong relationship between young countries and voter turnout of 0.51. This relationship is shown graphically in figure 6.

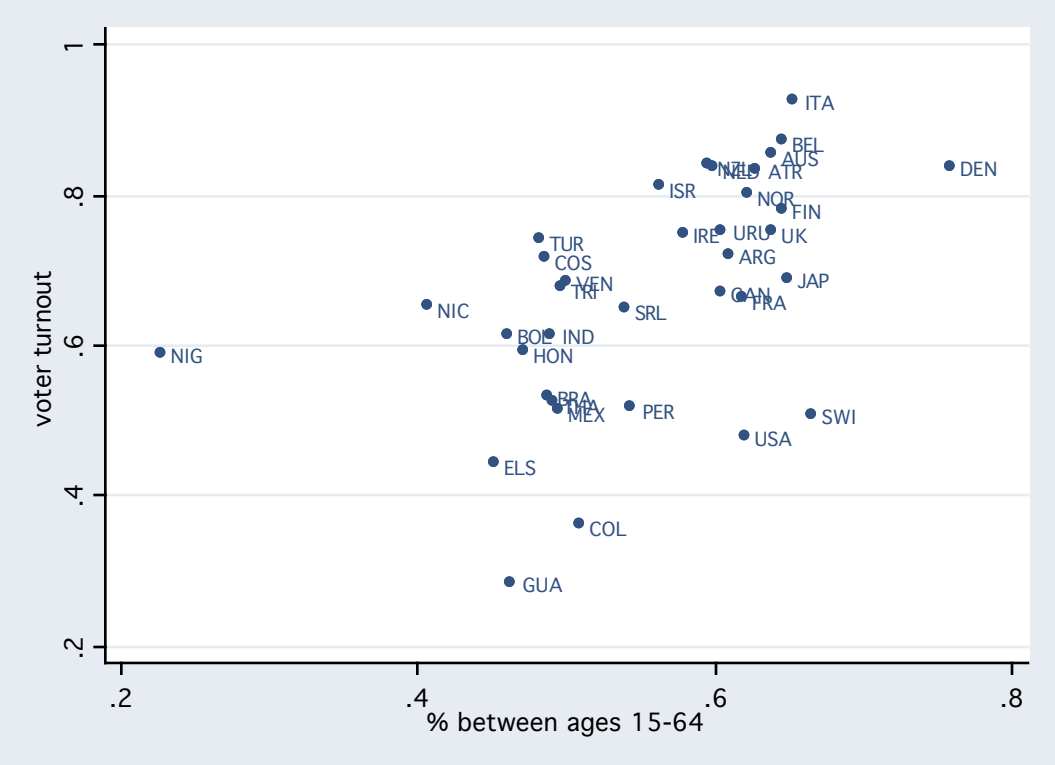

Figure 6.

The results of estimating this IV regression appear in column 5 of Table 3. Unfortunately, none of our coefficients are significant. One reason for our poor results is that there may be a strong correlation between our enrollment measure and the percentage of the population between the ages of 15 and 64. We would expect higher enrollment rates for countries with a larger portion of the population still in the schooling ages. This in turn could be introducing multicollinearity in our regression and therefore producing bad coefficient estimates. It seems then (at least for our specification) that the percentage of young people in the population is a bad instrument for social capital. However, we still have additional instruments to test.

3.3.4 Crime, Lawyers and The Social Sciences as Instruments

In this subsection we will use Putnam's claims about crime and written law to create additional instruments for social capital. First, we will consider using crime rates as an instrument for social capital and estimate our model using this instrument. To check the robustness of our results we use the number of riots occruing in a country as a measure of social capital. Second, we will use the percentage of law students (as a fraction of the total number of tertiary students) as an instrument for social capital. Similarly, we will use the percentage of social science students (as a fraction of tertiary students) as an instrument for social capital.

Putnam (2000) states that, "a potential yardstick for honesty and trustworthiness is the crime rate (pg. 144)." He shows that crime rates in the US began rising sharply about the same time that other measures of social capital began to decline. Furthermore, he argues that crime may be symptom of weakened social control and that the rule of law becomes the alternative to reciprocity and socially embedded honesty. The problem with

using crime rates for international comparisons is that many times these figures highly understate the true figures, since many crimes go unreported. However, following Fajnzylber, et al.'s (1998) framework, we use international homicides as a measure of social instability. They argue that international homicides will tend to be more reported than other national crime rates and thus will reflect better the true underlying social climate of a nation. We find a strong correlation negative correlation (-0.61) between international homicides and voter turnout, shown in figure 7. Regarding the possible endogenous determination of crime rates, we argue that crime rates and in particular international homicides may only be related to economic conditions of the past rather than the present and therefore will not be determined by growth occurring during our examined time period. Furthermore, international homicides may reflect cultural attitudes such as distrust or resentment towards tourists or foreigners rather than economic conditions. Under this provision we use the mean international homicide rates reported by Fajnzylber et al. (1998) as an instrument for social capital. To check the robustness of our results we use the average number of riots occurring during the years 1950-2000 as another measure of social instability. The results of running these two IV regressions appear respectively, in columns 1 and 2 of Table 4.

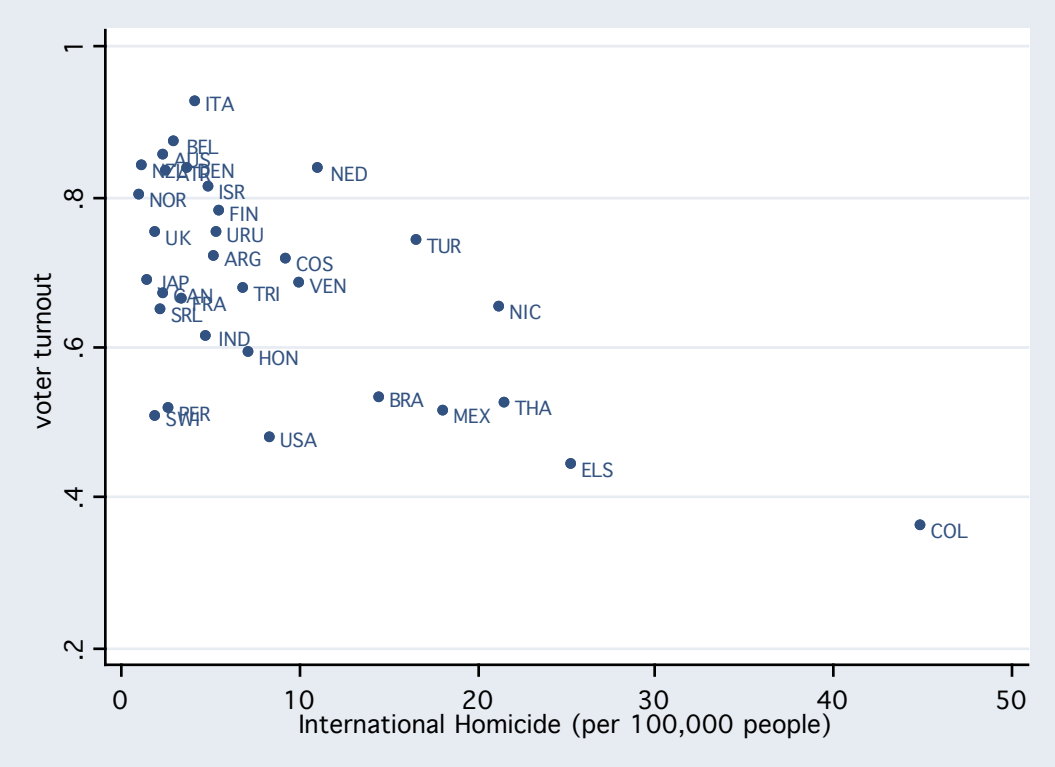

Figure 7.

As expected, both regressions are very similar to each other and to the results of previous regressions. Both regressions have considerable explanatory power based on their R^2 statistics. In both regressions voting has the wrong sign and is insignificant. The coefficients for the capital stock in 2000 and initial GDP per capita are both highly significant and very similar to previous results. An interesting note to mention here is that secondary school enrollment is significant at the 10% level (p-value of 0.072) in the international homicide IV regression. Fajnzylber et al. (1998) argue that education has a delayed crime alleviation effect because this effect does not materialize while the young are being educated but only once they become adults (pg. 32). Because education has a lagged effect on crime we should expect that secondary enrollment can be significant at the same time as our instrumented voter turnout, since education will not have a strong effect on current crime rates. Again it seems that under another one of Putnam's

conjectures, voting as a measure of social capital has no effect on income. For our next set of instruments we follow the arguments suggested by Knack and Keefer (1997).

Table 4 Dependent Variable logarithm of GDP per capita 2000

	1	2	3	4
Method	IV	IV	IV	IV
Independent Variables				
$vote_i$	-0.41	-1.27	-3.64	-1.92
	(-0.61)	(-0.67)	(-0.36)	(-0.56)
$\log k_i^{2000}$	0.64**	0.71**	0.69**	0.68**
	(10.29)	(7.88)	(5.51)	(8.89)
$enroll_i$	0.54♦	0.58	1.85	1.09
	(1.87)	(1.03)	(0.38)	(0.70)
$\log GDP_i^{1950}$	0.14♦	0.14	0.20	0.19♦
	(1.79)	(1.47)	(0.42)	(1.69)
β_0	2.08**	1.92*	2.80	2.12
	(3.54)	(2.05)	(0.68)	(1.39)
	N=32	N=36	N=33	N=33
	R^2= 0.96	R^2= 0.94	R^2= 0.84	R^2= 0.94

Notes: t-ratios in parentheses. ♦significant at 10% level *significant at 5% level **significant at 1% level.

Knack and Keefer (1997, pg. 1262) argue that less trusting, more litigious societies will have a higher demand for lawyers. Putnam (1993, pg. 126-127) attributes the proliferation of lawyers in Italian city-states to unusual confidence in written agreement and the law. Knack and Keefer (1997) find a strong negative relationship between their TRUST variable and the percentage of law students and also conclude that the number of law students does not belong in their growth regressions directly. For our sample we find a negative but weak relationship between voter turnout and the number of lawyers in a country (-0.36). To check the robustness of our results we use the percentage of students in the social sciences in 1960 as another instrument for social capital. We argue that a larger fraction of students in the social sciences reflects a society's interest in

it's functioning and improvement, since political science, sociology and economics are included in the social sciences. The results of running these IV regressions appear in the third and fourth columns (respectively) of Table 4.

Judging by the R^2 statistics it appears that using the percentage of students in the social sciences as an instrument for social capital is the better specification. Furthermore, it seems also that using the number of law students as an instrument for voting introduces multicollinearity in the regression. Voting in both regressions is insignificant and with the wrong sign. In the social science regression the capital stock and initial level of GDP are significant and with coefficients similar to previous estimates. While the results from this regression corroborate our previous findings it is important to realize that assuming Putnam's claim of voting being an "instructive proxy" for social capital, leads us to contradict Knack and Keefer's (1997) findings when using similar instruments.

3.3.5 Ethnic Homogeneity as an Instrument

For our final regression of the chapter we use another instrument similar to what is used in Knack and Keefer (1997). In their investigation, Knack and Keefer (1997) use Sullivan's (1991) measure of the proportion of the population belonging to the largest "ethnolinguistic" group as an instrument for social capital. It seems reasonable to believe that a polarized society either through religious, ethnic or linguistic divisions, will have less social capital. Furthermore, the ethnolinguistic make-up of a country should be determined independently of current economic conditions thus making it a viable instrument for social capital. A graphical representation of the relationship between voter turnout and ethnic homogeneity is presented in figure 8. As we can see the simple

correlation plot confirms our intuition that ethnically homogenous countries should have more social capital based on the upward sloping direction of the plot.

In addition to using ethnic homogeneity as an instrument for social capital we include additional variables related to the ethnic composition of a country in an attempt to quantify more precisely the ethnic issues within a country. Sullivan (1991, pg. 249) argues that problems with respect to minority rights in matters of social justice are often more related to levels of ethnic awareness (than to the size of particular groups or to the total number of such groups in a given country), and these problems are not necessarily confined to the least homogenous countries. To analyze this problem Sullivan (1991, pg 250) divides 70 states into four categories based upon increasing levels of problems related to ethnicity. These categories are:

1. ethnically interesting
2. ethnically problematic: states where the majority ruling group's relationship with some minority is problematic.
3. minority group rules: a minority group rules over larger segments of society but is apparently accepted to the extent that no insurgency has been provoked.
4. ethnic insurgency: states experiencing an ethnic insurgency.

For each of these four categories we create a dummy variable that is 1 when the country is included in the category and 0 otherwise. Hence, we use a two-stage least squares (2SLS) approach to estimate the following equations:

(1) $\log GDP_i^{2000} = \alpha + \beta_1 vote_i + \beta_2 \log k_i^{2000} + \beta_3 \log GDP_i^{1950} + \beta_4 enroll_i + \varepsilon_i$

(4) $vote_i = \gamma_0 + \gamma_1 \hom ogen_i + \gamma_2 \int er_i + \gamma_3 problem_i + \gamma_4 \min ority_i + \gamma_5 insurgency_i + \upsilon_i$

where: γ_0 is an additional intercept term, $hom\,ogen_i$ is the percentage of people belonging to the largest ethnic group, $int\,er_i$, $problem_i$, $min\,ority_i$, and $insurgency_i$ are dummies for the four categories and υ_i is a classical error term. Results of running this 2SLS regression appear in Table 5.

The results of the second stage are very similar to all of our previous results, thus confirming the robustness of our estimations. It is worth mentioning the results from the first stage. As expected we find that more ethnic homogeneity is associated with more social capital. Our coefficient for ethnic homogeneity, which is significant at the 1% level, implies that 1% increase in the proportion of the population belonging to the largest ethnic group is associated with an increase in turnout a little over half a percentage point. More interestingly, if a country is cataloged as ethnically problematic this is associated with a rise in voter turnout of roughly 20 percentage points relative to countries who are not ethnically problematic. Ethnically problematic countries are those who have not encountered violence due to ethnic grievances. Since no violence occurs we would expect democratic processes such as voting to remain unaffected in these countries, yet because of the underlying ethnic tensions we would expect increased voter turnout due to the inclusion of ethnic issues in the political climate of the nation. We hypothesize that the ethnic insurgency dummy is not significant since insurgencies of these types reflect deeper social problems that cannot be solved simply by placing adequate political parties in office. Finally, we conclude again that voter turnout is irrelevant to income and therefore irrelevant as a measure of social capital.

While studying the results of the first stage is interesting and instructive we will admit that our estimates are probably artificially inflated. Taking the estimated coefficients as representing the change in the dependent variable (in this case final income) given the change in one of the independent variables—holding the rest of the independent variables constant— may be a poor assumption for the first stage. Given the dynamic nature of the ethnic composition of a country, it seems unlikely that the effect of being an ethnically problematic state can be fully separated from the effect of increased homogeneity or having an insurgency. Therefore, it is very likely that our coefficients are overstating the true effect of changing one explanatory variable while holding the others constant.

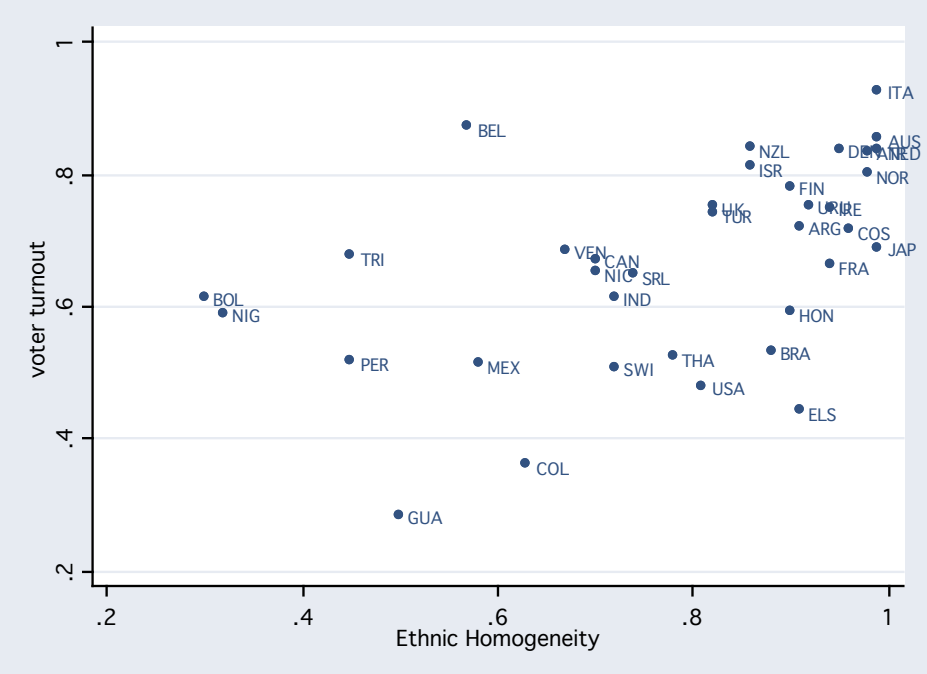

Figure 8.

Table 5 Dependent Variable logarithm of GDP per capita 2000

Method	2SLS
Independent Variables	
$vote_i$	.584484 (0.81)
$\log k_i^{2000}$	.6534317** (9.54)
$enroll_i$	.1136407 (0.34)
$\log GDP_i^{1950}$	.1614553♦ (1.80)
β_0	1.236967* (1.90)
	N=36 R^2= 0.9464
First Stage Voter turnout	
	equation (4)
$\text{hom}ogen_i$	.5406809** (3.82)
$\text{int}er_i$	-.0365176 (-0.50)
$problem_i$	.2004034* (2.17)
$\text{min}ority_i$	.2087461 (1.45)
$insurgency_i$	.0209456 (0.34)
γ_0	.2248566♦ (1.77)
	N=36 R^2=0.3896

Notes: t-ratios in parentheses. ♦significant at 10% level *significant at 5% level **significant at 1% level.

3.4 Expectations Revisited

At the beginning of this section we expected to find a relatively small but statistically significant effect of voter turnout on future income. Particularly motivated by

Knack and Keefer's (1997) findings, we expected positive results in favor of Putnam's claim that social capital can have an impact on aggregate economic activity. After a series of regressions we hypothesize that voter turnout has no direct effect on final income once other factors are controlled. While our findings do not necessarily contradict Knack and Keefer's (1997) findings on the economic payoff of social capital, we suggest either of the following reasons for our disappointing results: (1) voter turnout is not a good measure of social capital. Given that voting can be done entirely alone, voting does not represent any form of civic engagement nor does it help predict other behaviors that may be considered as civic engagement. (2) In the short-run, social capital has an immediate impact on economic performance while in the long-run the impact social capital has on economic performance is more subtle. For example, increased voter turnout may help pass government reforms that facilitate economic growth. If our second suggestion is correct, then what may be driving our negative results is specification error since our basic model cannot account for processes such as social capital affecting government performance. The next section focuses on a new specification that may capture the indirect channel through which social capital can improve economic performance.

4. Social Capital's Impact on Institutions

Given the negative results in favor of a link between our measure of social capital and growth, in this section we look for channels through which voter turnout may indirectly affect growth. La Porta et al. (1997) find that social capital improves the functioning of large organizations such as firms and the government. Thus, it is natural for us to ask if increased voter turnout —acting as social capital— can improve government functioning. Given that government quality can be judged based on several dimensions (such as bureaucratic efficiency or how adamantly it protects of property rights), we use a series of measures of government performance and examine how our measure of social capital affects each measure. Furthermore, given the possibility of reverse causation between improving governments and increasing social capital, we test the robustness of our results with another series of instrumental variable specifications using instruments similar to those presented in the previous section.

4.1 Democracy

First, we consider if voter turnout is associated with a more democratic government. As mentioned in section II, Putnam (2000) argues that social capital contributes to democracy in two ways. Externally, social capital, in the form of voluntary organizations, allows individuals to voice interests and demands on the government while protecting them from arbitrary actions of political leaders. Internally, networks of civic engagement instill in members habits of cooperation and public-spiritedness. Thus, intuitively we can expect a positive relationship between voter turnout and more democracy since voting represents the quintessential act of public-spiritedness—a democratic precept.

To test this hypothesis, we estimate the following equation (similar to what has been done in the literature):

(1) $polity_i = \alpha_0 + \alpha_1 vote_i + \alpha_2 \log GDP_i^{1950} + \varepsilon_i$

where $polity_i$ is a measure of the level of democracy in a nation (taken from the Polity IV data set) averaged over 1950-2000, and where $vote_i$, $\log GDP_i^{1950}$ and ε_i are as defined in the previous section. This simple functional form implies that physical capital and human capital do not affect the dependent variable. While this assumption may be problematic, once we instrument social capital, theoretically we rid the coefficient estimate from outside influences (such as these influences from physical and human capital, via the influence they have on final income). The error term in this regression represents unobserved or immeasurable cultural differences, which affect democracy in each nation. The results from estimating equation (1) via OLS appear in first column of Table 1.

Our initial regression seems to confirm our suspicion. The statistically significant coefficient on voter turnout implies that a one standard deviation (15 percentage points) increase in voter turnout is associated with an increase in the polity score (which ranges from -10 to 10) of 2.02 points. This change in the polity score would represent a considerable increase in the perceived i.e. subjective, democracy of a nation. Similarly, our estimated coefficient for initial income implies that a one standard deviation increase (0.74 log-points) in the logarithm of initial GDP per capita leads to a 1.66 point increase in the polity score. Hence, even when controlling for initial income, our social capital measure seems to predict the perceived level of democracy in a nation.

Table 1

	1	2
Method	OLS	IV
		Dependent Variable
	$polity_i$	$polity_i$
Independent Variables		
$vote_i$	13.48** (3.04)	25.88* (2.07)
$\log GDP_i^{1950}$	2.23** (2.48)	1.17 (0.83)
α_0	-21.18** (-3.16)	-20.82** (-2.79)
	N=36 R^2=0.44	N=36 R^2=0.31

Notes: t-ratios in parentheses. ♦ significant at 10% level, * significant at 5% level, ** significant at 1% level.

Since higher voter turnout should be expected in more democratic nations it is possible that our results are being inflated by the simultaneity between voter turnout and our measure of democracy. To circumvent this effect we run an IV regression using ethnic homogeneity as an instrument for voter turnout as presented in the previous section. We argue that ethnic homogeneity is not correlated with our measure of democracy since the polity measure is an assessment of the legal structure of the country rather than the country's actual capability of delivering democracy (which potentially could be a function of the ethnic composition of the country). The results of using ethnic homogeneity as an instrument for voter turnout appear in column 2 of Table 1.

Curiously, the coefficient on voter turnout increases and remains highly significant while the coefficient on initial income becomes insignificant. Our new

coefficient on voter turnout (almost twice as large as the previous one) implies that a one standard deviation increase in voter turnout leads to a 3.88-point increase in our measure of democracy. Again this change should be the result of considerable changes in the functioning of institutions. Hence, our results corroborate Putnam's claim that social capital is beneficial for democracy under the assumption that voter turnout is in fact a reasonable measure of social capital.

4.2 Law and Order

As another measure of government quality, we consider the average "law & order" score provided by Political Risk Services. According to PRS, their measure reflects the degree to which the citizens of the country are willing to accept the established institutions to make and implement laws and adjudicate disputes. It is unclear what effect will social capital have on this measure. On one hand, if social capital is high, formal institutions may be unnecessary in solving disputes. On the other, if social capital is low, established institutions and their rulings may be necessary to solve disputes. Using average "law & order" for the period 1985-1999 as dependent variable, we estimate the following equation:

(2) $law_i = \alpha_0 + \alpha_1 vote_i + \alpha_2 \log GDP_i^{1950} + \varepsilon_i$

The results of estimating this equation appear in the first column of Table 2.

Again it seems that voter turnout seems to be a very strong predictor of the perceived success of the government. Our estimated voter turnout coefficient implies that a one standard deviation increase in voter turnout is associated in a 0.63-point increase in the average "law & order" score. Given that the scale of this score is 1-6, this change should represent significant changes in the perceived effectiveness of the government.

Curiously, these results imply that a large stock of social capital is associated with a strong tradition of dependence on formal institutions, which contradicts Putnam's (2000) view that dependence on written law is a substitute for weak social networks. However, due to possible simultaneity biases between social capital and the acceptance of formal institutions, we proceed again to instrument voter turnout.

Using average life expectancy at birth for 1950-2000 (from the US Census Bureau), average infant mortality for the same period, and life expectancy at birth in 1970 (from the Global Development Finance and World Development Indicators) as instruments for voter turnout, we arrive at the results in columns 2 through 4, respectively, of Table 2. As in our polity IV regression, in our "law & order" IV regressions the coefficient on voter turnout is larger that the non-instrumented counterpart. In all three regressions this coefficient is statistically significant at the 1% level, while the coefficient on the logarithm of initial GDP per capita is significant at the 10% level in the first and third regressions (for the second regression the coefficient has a p-value of 0.135). Even when taking the lowest estimated coefficient (of the three regressions) for voter turnout, a one standard deviation increase in voter turnout is associated with a 1.53-point increase in the "law & order" score. Thus, even when controlling for possible simultaneity biases we can still argue that strong social networks are associated with the acceptance of formal legal institutions.

Table 2

	1	2	3	4
Method	OLS	IV	IV	IV
	Dependent Variable			
	law_i	law_i	law_i	law_i
Independent Variables				
$vote_i$	4.21** (3.50)	10.22* (2.63)	10.50** (2.50)	10.61** (2.89)
$\log GDP_i^{1950}$	1.26** (5.15)	0.74♦ (1.67)	0.72 (1.53)	0.71♦ (1.63)
α_0	-8.95** (-4.92)	-8.77** (-3.63)	-8.76* (-3.55)	-8.76** (-3.53)
	N=36 R^2=0.67	N=36 R^2=0.41	N=36 R^2=0.39	N=36 R^2=0.38

Notes: t-ratios in parentheses. ♦ significant at 10% level, * significant at 5% level, ** significant at 1% level.

4.3 Constraints on the Executive

A hallmark of an effective government is the set of restrictions a government places on itself to guarantee the protection of individuals from abuses of the government. As measure of this type of restrictions, we define $xconst_i$ as the average (for the period 1950-2000) score a country receives based on the number of institutionalized constraints it places on the executive. The results in the first column of Table 3 are the consequence of estimating the following equation:

(3) $xconst_i = \alpha_0 + \alpha_1 vote_i + \alpha_2 \log GDP_i^{1950} + \varepsilon_i$

The highly significant coefficient on voter turnout seems to imply that closely-knit societies demand strong accountability from their rulers, while the insignificant coefficient on initial income implies that income in 1950 does not determine the number

of constraints on the executive. Our estimated coefficient implies that a one standard deviation increase in voter turnout is associated with a 1.64-point increase in the score of institutionalized constraints on the executive. Because effectively constrained governments may evoke trust in citizens who then vote, reverse causality may be driving our overly optimistic results. As with our previous IV regressions, we instrument voter turnout with average life expectancy at birth, average infant mortality, and life expectancy at birth in 1970. The results of running these IV specifications appear in the second, third, and fourth columns (respectively) of Table 3.

In all three IV regressions voter turnout is significant while initial income is not. In the first two regressions, voter turnout is significant only at the 10% (however the p-value for the first regression is 0.078). The very large (24.77) and highly significant coefficient on voter turnout in the third coefficient disagrees substantially with the results of the other two IV regressions and thus casts some doubt on the precise magnitude of the impact of voter turnout on executive constraints. However, the three regressions combined do provide some evidence that voter turnout has a positive and significant (both statistically and economically) effect on the structure of constraints on the executive. Next, we examine whether our measure of social capital has any effect on more basic measures of government quality such as corruption, contract enforcement and, the protection of property rights.

Table 3

	1	2	3	4
Method	OLS	IV	IV	IV
		Dependent Variables		
	$xconst_i$	$xconst_i$	$xconst_i$	$xconst_i$
Independent Variables				
$vote_i$	10.91**	17.45♦	17.21♦	24.77**
	(2.90)	(1.82)	(1.70)	(2.47)
$\log GDP_i^{1950}$	1.17	0.61	0.63	-0.02
	(1.52)	(0.55)	(0.56)	(-0.02)
α_0	-12.29*	-12.10*	-12.10*	-11.88♦
	(-2.16)	(-2.03)	(-2.04)	(-1.75)
	N=36	N=36	N=36	N=36
	R^2=0.35	R^2=0.29	R^2=0.29	R^2=0.08

Notes: t-ratios in parentheses. ♦ significant at 10% level, * significant at 5% level, ** significant at 1% level.

4.4 Corruption

In his study of regions of Italy, Putnam finds that regions such as Emilia-Romagna and Tuscany —where strong traditions of civic involvement and social solidarity had existed over thousands of years (some traditions traced back to the eleventh century)— had representative governments that were efficient in managing the public's business and satisfying their constituents. Regions such as Calabria and Sicily —which were not characterized by strong traditions of civic involvement— had much more inefficient, lethargic and corrupt governments. Putnam concludes that the factor driving these divergent stories is social capital. He argues that social capital facilitates the performance of the representative government since social capital can help lower transactions costs and ease dilemmas of collective action. Given this argument, the next

two dependent variables we consider are indices of corruption and property rights. If it were true that social capital lowers transaction costs and eases dilemmas of collective action then we would expect our measure of social capital to have a strong significant effect on each of these indices.

To examine the effect that voter turnout may have on corruption, we consider the average corruption score for 1982-1995 from the International Country Risk Guide (ICRG) as previously used in the literature by Levine et al. (2000) and Mauro (1995). For this index a higher score indicates a low level of corruption. Therefore we define the following equation to be estimated:

(4) $corrupt_i = \alpha_0 + \alpha_1 vote_i + \alpha_2 \log GDP_i^{1950} + \varepsilon_i$

Results of estimating this equation appear in column 1 of Table 4.

Judging by the significance and magnitude of the estimated coefficient on voter turnout it seems that it does have an important corruption ameliorating effect. For our restricted sample (N=33) a one-standard deviation (16 percentage points) increase in voter turnout is associated with a 0.8-point increase in the corruption score—meaning corruption should decrease. Similarly, a one-standard deviation (0.7 log points) increase in initial GDP per capita leads to a 1.34-point increase in the corruption score. Again in this scenario it is not entirely clear that voter turnout can be taken as exogenous. From a very simplistic point of view, it could be possible that given high levels of corruption citizens become jaded and indifferent to their country's politics and thus refrain from voting. Conversely, low levels of corruption may induce high voter turnout. To evade these possibilities we instrument voter turnout in equation (4) with infant mortality, life

expectancy at birth, and ethnic homogeneity. The results of these IV regressions appear in columns 2 through 4 of Table 4.

Again as with most of our previous IV regressions, the instrumented version of the coefficient on voter turnout is large and remains highly significant. In all three IV regressions initial income is insignificant and judging by the R^2 statistics, the explanatory power of the regressors of equation (4) is reduced when voter turnout is instrumented. However, the conclusion we arrive at remains the same—voter turnout reduces the incidence of corruption. Our smallest estimated coefficient on voter turnout implies that a one-standard deviation increase in voter turnout induces roughly a 2.3-point increase in the corruption score (which ranges from 0 to 10). This change in the corruption score should represent noticeable changes in the delivery of public goods.

Table 4

	1	2	3	4
Method	OLS	IV	IV	IV
	Dependent Variable			
	$corrupt_i$	$corrupt_i$	$corrupt_i$	$corrupt_i$
Independent Variables				
$vote_i$	5.03**	15.31**	15.66**	14.30**
	(2.41)	(2.71)	(2.82)	(2.32)
$\log GDP_i^{1950}$	1.91**	0.91	0.88	1.01
	(4.13)	(1.16)	(1.11)	(1.25)
α_0	-12.20**	-10.78**	-10.73*	-10.92**
	(-3.52)	(-2.29)	(-2.25)	(-2.42)
	N=33	N=33	N=33	N=33
	R^2=0.57	R^2=0.21	R^2=0.19	R^2=0.28

Notes: t-ratios in parentheses. ♦ significant at 10% level, * significant at 5% level, ** significant at 1% level.

4.5 Contract Enforcement and Property Rights

In an influential article, North and Weingast (1989) emphasize the role of the government in protecting and enforcing property rights and the importance of these rights in the Industrial Revolution. For our discussion it seems only natural to verify if social capital influences how fervently a government enforces property rights. To test this claim we introduce two new dependent variables: $enforce_i$ and $proprights_i$. The first variable is taken from the data set used in Levine et al. (2000) and is a combined measure of law and order tradition and the risk that a government may change the terms of a contract after it has been signed. The second variable is a property rights score in 2000 taken from the Index of Economic Freedom. Using the first variable as the dependent variable in our regression we arrive at the results presented in the first column of Table 5.

Our initial results when using $enforce_i$ as a dependent variable are very similar to those when using law_i as a dependent variable. This serves as a consistency check since $enforce_i$ includes a measure of law and order. While the coefficient on voting in this regression is only significant at the 10% level (compared to 1% in the regression in column 3 of Table 1) the difference in magnitude between each of estimated coefficients is roughly 0.18.

Again to circumvent the possible simultaneity between our dependent variable and social capital, we instrument voter turnout with infant mortality, life expectancy and ethnic homogeneity. The results of using these measures as instruments of social capital appear in the second through fourth columns of Table 5. We are able to conclude that voter turnout does have a significant impact on increasing the tradition of law and order in a country and in reducing the risk of a government changing the terms of a contract

after it has been signed. The results when using ethnic homogeneity as an instrument are the most significant and they imply that a one-standard deviation (0.15) increase in voter turnout leads to a 1.5-point increase in the $enforce_i$ score, which ranges from 1 to 10 (10 being strong law and order tradition and low risk of contract alteration).

Table 5

	1	2	3	4
Method	OLS	IV	IV	IV
	Dependent Variable			
	$enforce_i$	$enforce_i$	$enforce_i$	$enforce_i$
Independent Variables				
$vote_i$	4.03♦ (1.79)	11.45♦ (2.89)	12.61* (1.96)	10.15* (2.13)
$\log GDP_i^{1950}$	1.66** (3.72)	1.06 (1.47)	0.97 (1.32)	1.16♦ (1.93)
α_0	-8.91** (-2.60)	-9.06* (-2.19)	-9.08* (-2.09)	-9.03** (-2.30)
	N=27 R^2=0.52	N=27 R^2=0.31	N=27 R^2=0.24	N=27 R^2=0.38

Notes: t-ratios in parentheses. ♦ significant at 10% level, * significant at 5% level, ** significant at 1% level.

Finally, we consider the impact social capital has on property rights. Given the strong effect that social capital has on law and order and contract enforcement, intuitively we would expect that a more basic measure (such as property rights) also to be significantly explained by our measure of social capital. However, in unreported regressions we were unable to conclude that social capital had a significant effect on a measure of risk of expropriation (which is highly negatively correlated with our property rights measure). Thus, a priori it is unclear if voter turnout will have a significant impact

on property rights. The results of using property rights as the dependent variable in our regressions appear in column 1 of Table 6.

The OLS estimator for the coefficient on voter turnout implies a significant decrease in the property rights score (which means the government protects property rights well) when social capital is increased. For example, a 10% increase in voter turnout decreases the property rights score by 0.16 points. Higher initial income is also associated with a lower property rights score (or equivalently stronger protection of property rights by the government). While the magnitude of the effect voter turnout has on this dependent variable is much smaller than on previous dependent variables, the scale for the property rights score is also much smaller (1 to 3). Even when we instrument voter turnout with infant mortality, life expectancy, and ethnic homogeneity (columns 2 through 4 respectively of Table 6) the effect of voter turnout on property rights remains significant and actually increases in magnitude. Thus, our results suggest that social capital may have a favorable impact on the enforcement of property rights.

Table 6

	1	2	3	4
Method	OLS	IV	IV	IV
	Dependent Variable			
	$proprights_i$	$proprights_i$	$proprights_i$	$proprights_i$
Independent Variables				
$vote_i$	-1.60* (-1.93)	-6.70* (2.13)	-6.06** (-2.19)	-4.11♦ (-1.73)
$\log GDP_i^{1950}$	-0.81** (-4.84)	-0.38 (-1.08)	-0.43 (-1.37)	-0.59** (-2.25)
α_0	9.72 (7.76)	9.57** (5.20)	9.59** (5.58)	9.65** (6.80)
	N=36 R^2=0.56	N=36 R^2=0.06	N=36 R^2=0.18	N=36 R^2=0.44

Notes: t-ratios in parentheses. ♦ significant at 10% level, * significant at 5% level, ** significant at 1% level.

4.6 Summary

To summarize, in this chapter we have presented considerable evidence in favor of the hypothesis that social capital improves government performance. For a series of measures of government performance and effectiveness we have found consistent evidence that higher social capital increases government efficiency and accountability. It seems then that a "culture of democracy" or of civic and political participation is important to maintain checks and balances on the government. From a simplistic point of view, if political and civic participation represent the demand for more public goods, then the government acting as a supplier of public goods will produce more of them. The results presented in this chapter also suggest that our simplistic view of voter turnout

having a direct effect on economic growth was incorrect. Rather, the long-term gains of increases in social capital in the form of political participation may come in the form of better institutions. In turn, better institutions should foster long-term growth.

5. Concluding Remarks

The purpose of this thesis was to propose a new measure of social capital and verify the robustness of results presented in previous articles measuring the social capital effect on economic growth. Compared with previous measures of social capital, voter turnout seems to be more adequate for cross-country studies since it is immune to cultural biases in reporting and interpretation. Given its availability over extensive time periods, our measure of social capital should also capture long-run features of the social climate of each country we consider. Finally, our measure is inherently easier to quantify than trust and civic norms.

Following a specification similar to that used by Knack and Keefer (1997), our results from section 3 seemed to disagree with their findings, even once controlling for simultaneity biases by using instruments similar to the ones used in their investigation. Rather than contradicting previous work, our initial results may suggest that compared to the short-run, the impact social capital has on growth is less apparent in the long run. Social capital may help for short-run adjustments in economic performance, while in the long-run standard arguments to reach the balanced growth path apply. In addition, the mechanism through which social capital impacts long-run economic performance may not be as direct as our initial specification (and previous literature) assumes.

In consideration of this problem we examined the possibility that social capital influences government performance in section 4. Using a specification similar to the one proposed in La Porta et al. (1997), we find strong evidence that our measure of social capital increases government performance (measured using several indices). In particular, we find that more social capital is associated with less corruption, stronger property

rights, less risk of contract alteration, a stronger tradition of law and order and, overall more democracy in a nation.

Thus, our results raise questions about the previous findings in the literature and how precisely do the World Values Surveys represent social capital. Since our investigation covers a longer time period than previous investigations [i.e. La Porta et al. (1997) and Knack and Keefer (1997)], new research should consider using voter turnout as a measure of social capital over shorter periods of time in order to categorically verify the results of the formerly mentioned investigations.

Our results suggest that: (1) the social capital effect on economic performance is different in the short-run and long-run; and (2) the results derived from short-run studies may be overly optimistic of the true impact social capital has on economic performance. This optimism may stem from the inadequacy of the measures of social capital derived from the WVS.

Our results also suggest that if social capital has any impact on long-run growth it may be by improving government performance that subsequently aids the accomplishment of economic outcomes. While the absence of formal theory may deteriorate the veracity of our empirical results, further research should attempt to support this claim. Hall and Jones (1999) suggest that a large portion of differences in output per worker between countries can be attributed to social infrastructure. "A country's long-run economic performance is determined primarily by the institutions and government policies that make up the economic environment within which individuals and firms make investments, create and transfer ideas, and produce goods and services (pg. 114)." Hall and Jones (1999) thus argue that differences in capital accumulation,

educational attainment and productivity (which help explain differences in income across countries) are caused by differences in social infrastructure across countries. Our results from section 4 could suggest that social capital may be an observable determinant of social infrastructure—a result that can be useful in other studies. Following Hall and Jones' (1999) discussion we can then argue that social capital in the form of political participation improves the social infrastructure of a nation and thus contributes to growth. The question of the endogenous determination of social capital then arises. While our work provides some suggestions on how to deal with this problem, further research should consider this question theoretically and empirically.

While the estimates in section 4 constitute upper bounds of the true effect that social capital has on government performance (since voter turnout can overstate the actual level of social capital in a nation because it can be done entirely alone), our estimated effects are large enough that even after some downgrading, social capital could remain significant for government performance. Conversely, since we only look at parliamentary elections, voter turnout in these elections can understate the true level of political participation (and hence social capital in a nation) if presidential elections are more attractive from a voting standpoint. Further research should try to study more countries, consider separately presidential and parliamentary elections and, examine longer time periods in order to further generalize the findings presented in this thesis. Also, the application of time-series methods to our data would be useful to fully account for inter-temporal changes in social capital.

Most importantly, it is necessary to admit that when dealing with such an intangible object such as social capital, qualitative results are more instructive than

quantitative results. Adhering to the belief that sustained increases in voter turnout will lead to 2-point increases in polity scores is somewhat naive. Rather, our quantitative results should serve as guidelines for qualitative statements such as " sustained increases in voter turnout (which represent increases in social capital) can potentially lead to significant improvements in political competitiveness that subsequently lead to increases in the delivery of public goods which finally enhance growth."

In addition, new research could consider natural experiments. Given that social capital may be considered as a determinant of social infrastructure, new research could examine changes in social capital during periods when institutions are observably changing. For example, new research could examine trends in the level of social capital of Chile leading up to the removal of Salvador Allende and thereafter the instatement of Augusto Pinochet. Case studies could help provide evidence for the increasing role of social capital in determining the social infrastructure of a nation when institutions are weak. Likewise, case studies could demonstrate that social capital is only important for the social infrastructure of a nation only once institutions are well established.

Finally, it is important to emphasize the importance of our findings in a more general context. Relevant to the present social state of the world is our discussion of a "culture of democracy." Our empirical results in section 4 stress the importance of a "culture of democracy" for the improvement of institutions. Over two centuries ago De Tocqueville (1984) highlighted the importance of civic participation in early America. Two centuries later it seems that civic engagement and political participation may regain relevance in countries such as Iraq. The hypothesis of this thesis would argue that the

development of new fruitful institutions in Iraq would benefit from social cooperation within the nation. History shall serve as the final judge of our conclusions.

Data Appendix

In this appendix we include the definition of each variable, how it was calculated and its source. We also provide the list of countries in our data set.

Variable	Definition and Calculation	Source
TRUST	percentage of people in each nation responding "most people can be trusted	Knack and Keefer (1997)
$vote_i$	number of votes divided by the Voting Age Population figure (number of people in population who meet age requirements to vote). Only parliamentary elections occurring in 1950-2000 were considered. This value is the average over all elections in 1950-2000 for each country	International Institute for Democracy and Electoral Assistance (IDEA)
$\log GDP_i^{2000}$	logarithm of GDP per capita in 2000	Penn World Tables 6.1
$\log k_i^{2000}$	logarithm of the capital stock per capita in the year 2000. This value was approximated by using investment per capita levels for each year in the 1950-2000 period and assuming a 10% depreciation rate. We used the following series formula: $\sum_{i=1}^{51}(1-\delta)^i Inv^{2000-(i-1)}$ where δ denotes depreciation	Penn World Tables 6.1
$\log GDP_i^{1950}$	logarithm of GDP per capita in 1950	Penn World Tables 6.1
$enroll_i$	gross secondary enrollment ratio. Gross secondary enrollment (regardless of age) divided by the population of the age group that corresponds to this level of education. This value was averaged over 1950-2000.	Easterly (2001), Global Development Finance & World Development Indicators (2000)

$catholic_i^{1980}$	percentage of the population in 1980 that is Catholic	Levine et al. (2000)
mus_i^{1980}	percentage of the population in 1980 that is Muslim	Levine et al. (2000)
$french_i$	dummy variable for French legal origin	Levine et al. (2000)
$british_i$	dummy variable for British legal origin	Levine et al. (2000)
$german_i$	dummy variable for German legal origin	Levine et al. (2000)
life expectancy at birth in 1970	number of years a newborn would life if prevailing patterns of mortality at the time of birth remain the same	Easterly (2001), Global Development Finance & World Development Indicators (2000)
average life expectancy	number of years a newborn would life if prevailing patterns of mortality at the time of birth remain the same. This value is averaged for each year in 1950-2000.	International Data Base (IDB) US Census Bureau
average infant mortality	number of infant deaths per 1,000 live births. This value is averaged over each year in 1950-2000.	IDB
average crude death rate	number of deaths per 1,000 in population. This value was averaged over the longest time period within the years of 1950-2000 with a minimum requirement of a 20 year period.	IDB
middle	percent of the population between the ages of 15 and 64 (inclusive). This value was averaged over the period 1950-2000.	IDB
international crime rates	death intentionally inflicted to a visitor in a foreign country, per 100,000 in population. These are mean values covering the period 1950-2000 as reported by the source.	Fajnzylber et al. (1998)
riots	number of violent demonstrations or clashes of more than 100 citizens	Easterly (2001), Global Development Finance & World Development

	involving the use of physical force	Indicators (2000)
law students in 1960	total number of law students in 1960. For the US and UK total number of law graduates was used since data on number of students is unavailable.	UNESCO Statistical Yearbook 1965
students in the social sciences in 1960	total number of students in the social sciences	UNESCO Statistical Yearbook 1965
$\text{hom}\,ogen_i$	proportion of the population belonging to the largest ethnic group circa 1983	Sullivan (1991)
$\text{int}\,er_i$	ethnically interesting dummy	Sullivan (1991)
$problem_i$	ethnically problematic dummy	Sullivan (1991)
$\text{min}\,ority_i$	dummy for a country where a minority group rules with no opposition	Sullivan (1991)
$insurgency_i$	dummy for a country where there exists an ethnic insurgency	Sullivan (1991)
$polity_i$	difference between democracy score and autocracy score (averaged for each year over 1950-2000). The democracy is an eleven-point score (0-10) based on competitiveness of political participation, openness and competitiveness of executive recruitment and constraints on the chief executive. The autocracy score is also an eleven-point score based the same parameters as the democracy score.	POLITY IV dataset
law_i	measure of the tradition of law and order in a nation. Averaged over 1985-1998	Levine et al. (2000). Political Risk Services, International Country Risk Guide.
$xconst_i$	measure of the number of constraints on the chief executive	POLITY IV dataset
$corrupt_i$	index of corruption with 0 high corruption and 10	Levine et al. (2000). Political Risk Services, International

	corruption. Averaged over 1982-1995.	Country Risk Guide.
$enforce_i$	average of rule of law score and contract risk score for years 1982-1995	Levine et al. (2000). Political Risk Services, International Country Risk Guide.
$proprights_i$	rating of property rights in 2000 on a scale of 1 (strong) to 3 (weak)	Index of Economic Freedom
$bureau_i$	measure of bureaucratic efficiency which considers the efficiency of the judiciary system, red tape and corruption over the period 1980-1983.	Levine et al. (2000). Business International Corporation (1984). Mauro (1995).

Countries used in regressions:

Argentina
Australia
Austria
Belgium
Bolivia
Brazil
Canada
Colombia
Costa Rica
Denmark
El Salvador
Finland
France
Guatemala
Honduras
India
Ireland
Israel
Italy
Japan
Mexico
Netherlands
New Zealand
Nicaragua
Nigeria
Norway
Peru
Sri Lanka
Switzerland
Thailand
Trinidad & Tobago
Turkey
United Kingdom
Uruguay
USA
Venezuela

References

Acemolgu, Daron, Johnson, Simon and Robinson, James. "Institutions as the Fundamental Cause of Long-run Growth," in eds. Aghion, Phillipe and Durlauf, Steven D, *the Handbook of Economic Growth,* North-Holland, 2004.

Barro, Robert J. "Economic Growth in a Cross Section of Countries," *The Quarterly Journal of Economics*, May 1991, 106(2), pp. 407-443.

Business International Corporation. *Introduction to the Country Assessment Service*, New York: Business International Corporation, 1984.

Conway, M. Margaret. Political Participation in the United States, 2nd ed., Washington D.C.:CQ Press, 1991.

Easterly, William R, World Bank. Global Development Network Growth Database, http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/0,,contentMDK:20356379~pagePK:64165401~piPK:64165026~theSitePK:469382,00.html#4), 2001.

Fajnzylber, Pablo, Lederman, Daniel and Loayza, Norman. Determinants of Crime Rates in Latin America and the World An Empirical Assessment, Washington, D.C.: The International Bank for Reconstruction and Development/The World Bank, 1998.

Hall, Robert E. and Jones, Charles I. "Why Do Some Countries Produce So Much More Output per Worker than Others?" *The Quarterly Journal of Economics*, February 1999, 114(1), pp. 83-116.

Hayashi, Fumio. *Econometrics*, Princeton, NJ: Princeton University Press, 2000.

Hayek, Friedrich A. *The Road to Serfdom*. Chicago, IL: The University of Chicago Press, 1944.

Hayek, Friedrich A. *The Constitution of Liberty*. Chicago, IL: The University of Chicago Press, 1960.

Heston, Alan; Summers, Robert; and Aten, Bettina. *Penn World Tables Version 6.1*, Center for International Comparisons at the University of Pennsylvania (CICUP), October 2002.

Heritage Foundation. *2005 Index of Economic Freedom Downloads, http://www.heritage.org/research/features/index/downloads/PastScores.xls*

International Institute for Democracy and Electoral Assistance. *International Institute for Democracy and Electoral Assistance,* http://www.idea.int/vt/country_view.cfm

Knack, Stephen. "Social Altruism and Voter Turnout: Evidence from the 1991 NES Pilot Study," College Park, MD: University of Maryland, 1992.

Knack, Stephen and Keefer, Phillip. "Does Social Capital Have an Economic Payoff? A Cross-Country Investigation." *The Quarterly Journal of Economics*, November 1997, 112(4), pp. 1251-1288.

La Porta, Rafael, Lopez-de-Silanes, Florencio, Shleifer, Andrei and Vishny, Robert W. "Trust in Large Organizations." *The American Economic Review, Papers and Proceedings of the Hundred and Fourth Annual Meeting of the American Economic Association,* May 1997, 87(2), pp. 333-338.

La Porta, Rafael, Lopez-de-Silanes, Florencio, Shleifer, Andrei and Vishny, Robert W. "Law and Finance." *The Journal of Political Economy,* December 1998, 106(6), pp. 1113-1155.

Levine, Ross, Loayza, Norman and Beck Thorsten. "Financial intermediation and growth: Causality and causes." *Journal of Monetary Economics*, 2000, 46(1), pp. 31-77.

Levine, Ross and Zervos, Sara. "Stock Markets, Banks, and Economic Growth." *The American Economic Review*, June 1998, 88(3), pp. 537-558.

Mankiw, Gregory N., Romer, David and Weil, David N. "A Contribution to the Empirics of Economic Growth." *The Quarterly Journal of Economics*, May 1992, 107(2) pp. 407-437.

Marshall, Monty G. and Jaggers, Keith. *Polity IV Dataset*, 2002.

Mauro, Paolo. "Corruption and Growth," *The Quarterly Journal of Economics,* August 1995, 110(3), pp. 681-712.

McCann, James A. " Electoral Participation and Local Community Activism: Spillover Effects, 1992-1996," *Annual Meeting of the American Political Science Association, Boston*, September 1991.

North, Douglas C. and Weingast, Barry R. "Constitutions and Commitment: The Evolution of Institutions Governing Public Choice in Seventeenth-Century England." *The Journal of Economic History*, December 1989, 49(4), pp. 803-832.

Political Risk Services. Syracuse, NY: International Country Risk Guide, various years.

Putnam, Robert D. *Bowling Alone: The Collapse and Revival of American Community*, New York, NY: Simon &Schuster Inc., 2000.

Pritchett, Lant. "Divergence, Big Time," *Journal of Economic Perspectives*, Summer 1997, 11(3), pp. 3-17.

Sullivan III, Michael J. *Measuring Global Values*, New York: Greenwood Press, 1991.

Tocqueville, Alexis D. *Democracy in America; specially edited and abridged for the modern reader by Richard D. Heffner,* New York: New American Library, 1984.

UNESCO Statistical Yearbook 1965, New York: UNESCO Publications Center, 1966.

US Census Bureau. *International Database.*
http://www.census.gov/ipc/www/idbnew.html

World Bank. *Global Development Finance 2000*, 2000.

World Bank. *World Development Indicators 2000*, 2000.